

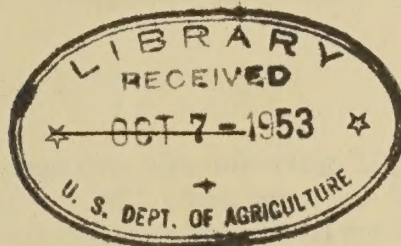
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MISSISSIPPI 22 LEAKE

FIELD APPRAISAL ANALYSIS

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Prepared by  
Field Appraisal Section  
Program Analysis Division  
RURAL ELECTRIFICATION ADMINISTRATION



Field Appraisal  
Completed in  
April 1953

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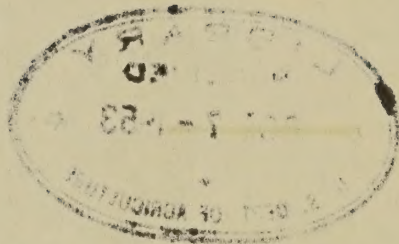
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MISSISSIPPI STATE

STATE OF MISSISSIPPI

THE STATE OF MISSISSIPPI  
OFFICE OF THE ATTORNEY GENERAL  
JAMES H. BEVEL  
JANUARY 1, 1933



James H. Bevel  
Attorney General  
January 1, 1933



May 29, 1953

Field Appraisal Section  
Program Analysis Division

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SUMMARY AND CONCLUSION  
MISSISSIPPI 22 LEAKE

AREA CHARACTERISTICS

The area wherein the Central Electric Power Association is located lies in the Red Hills, the topography of which is thoroughly dissected, hilly upland, with sandy and sandy clay soils which are relatively infertile. Population decreased by 19 percent during the decade 1940-1950. Farm numbers increased more than 8 percent during the 5-year period 1945-1950. This was due to the substantial increase in part-time and residential farms. Farms averaged 67 acres in 1950. They were valued at \$3,535, or an average of \$54 per acre. Most farmers raise some cotton, corn, peanuts, hay and peas. There is a noticeable trend toward dairying and broiler production in the area. Although primarily an agricultural area, income from all products sold per farm averaged only \$741 in 1949. This was 11 percent below the 1944 average, and is only about one-half the 1949 State average. Area leaders have indicated that the primary reason for the poor showing in 1949 was a drought and resulting poor crops. Off-farm income has been important in providing a means for farm consumers to purchase producer and consumer durables. Credit has also been a significant factor. Dealers in the area report that approximately 85 percent of the appliances and equipment they sell are bought on an installment basis.

ULTIMATE NUMBER OF CONSUMERS

On February 26, 1953, this cooperative was serving 10,586 consumers. The manager has estimated a total of 12,000 consumers to be receiving service in 10 years. A random sample of consumer units developed for the survey was used to appraise the manager's estimates. From a careful consideration of related factors believed to be significant, an estimate of 11,600 ultimate consumers appears reasonable.

ESTIMATED FUTURE CONSUMPTION OF ELECTRICITY

Since this cooperative was energized in 1938, average monthly farm and nonfarm residential consumption rose to 127 kwh for the 12 months ended March 1953. This is an average increase of about 9 kwh per month per year. Since 1949 the increase has been from 90 to 124 kwh in 1952. This is an average of about 11 kwh per month per year. Consumers indicated that their consumption would increase by 33 percent during the next 3 years. Studies in this general area show that in the past consumers required 5 years to achieve what they had indicated they would achieve in 3.

Several factors are favorable to the continued increase in consumption of electricity in this area. Being a TVA system, the power costs are relatively low and competition from butane gas can generally be met. Power utilization



2-Summary - Mississippi 22 Leake - May 29, 1953

activities of the cooperative have over the past year raised the saturation of electric ranges, home freezers and other heavy uses of electricity. Credit is readily available in the area to those consumers needing it in the purchase of appliances and equipment. The area economy is in a state of transition from row crops to diversified farming which should not only provide more income for the purchase of electrical equipment, but also increase the need for electricity in production. One of the factors that will tend to counterbalance the favorable possibilities for future use is that much education is needed to enlighten area consumers on the contribution electricity can make to the farm home and the farm business. Also, butane is being used to a large extent for house heating and to a lesser extent for cooking. Any decline in economic level affecting commodity prices, area off-farm employment, or wage rates would deter the rate of increase which might reasonably be expected on this system.

Based on factors believed to be significant, this analysis leads to the following estimates which are certified as being reasonable and may be expected to be attained by the years specified.

<u>Class of Consumer</u>	<u>Calendar</u>			
	<u>1952</u>	<u>1955</u>	<u>1958</u>	<u>1963</u>
Farm	122	155	185	240
Nonfarm and Town Residential	172	190	210	240
Small Commercial	301	340	385	450
Public Buildings	94	120	135	155
Street Lights (annual)		4,400	4,700	5,000
Large Commercial (annual)				
A. Deweese Lumber Company				
(200 kw - 2 meters combined)		485,000	485,000	485,000
Lee Bros. Feed Company (25 kw)		10,000	10,000	10,000

E. C. Weitzell, Chief  
Program Analysis Division



May 29, 1953

Field Appraisal Section  
Program Analysis Division

ANALYSIS OF BASIC FACTORS RELATED TO  
THE RURAL ELECTRIFICATION LOAN FOR  
MISSISSIPPI 22 LEAKE

This analysis of basic factors related to the future consumption of electricity by consumers of the Central Electric Power Association, with headquarters at Carthage, Mississippi (Figure 1), is based on a field study conducted by Richard G. Schmitt, Jr., Head, Field Appraisal Section, during the period April 13 to 24, 1953. Mr. Schmitt also prepared this analysis. The field work consisted primarily of interviews with 220 served farm and nonfarm consumers.<sup>1/</sup> Businessmen, bankers and agricultural leaders were consulted regarding local economic trends and their estimates of the future for the area with respect to the use of electric power. Supporting economic data were obtained from the U. S. Census for Leake and Neshoba Counties and from other secondary sources.

ULTIMATE NUMBER OF CONSUMERS

On March 31, 1953, the cooperative was serving 10,627 consumers of which 9,208 were classified as farm, 639 as nonfarm residential, 4 as town, and the remainder as commercial consumers. The manager has estimated a total of 12,000 consumers to be served within 10 years (provided to REA in letter dated March 10, 1953). The manager has indicated by class those consumers he expects to serve in the immediate future in his letter (Figure 2). Since the manager did not classify all of the consumers he expects to serve, the ratio existing among those for which service is to be provided during 1953 was used to classify the additional potentials.

The number of various classes of consumer units as disclosed by an expansion of the sample data is compared with the manager's estimates in Table I. Sample data were corrected to the numbers of presently served consumers, and other classes were adjusted accordingly. Based on the adjusted sample data and economic trends in the area as reflected in this study, 11,600 consumers appears to be a reasonable estimate of the ultimate number of consumers to be connected by this system.

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<sup>1/</sup> Note on representativeness of the sample. Respondents in the survey were randomly selected and comprise an area sample of approximately 2.8 percent of the consumer units existing in the area. Sample consumers actually averaged 148 kwh per month during 1952. This is approximately 18 percent above the average of 125 kwh per month for all farm and nonfarm residential consumers for the same period. This difference may appear large, but since the standard deviation of the sample was 191 kwh, the sample mean of 148 kwh does not differ significantly from the true mean  
(cont'd on page 3)



TABLE I

DISTRIBUTION OF CONSUMER UNITS WITH  
RESPECT TO ELECTRIC SERVICE

Class (1)	Number in Sample (2)	Expanded Number <sup>a/</sup> (3)	Manager's Estimate (4)	Estimated Number (5)
<u>Served</u>				
Farm	179	6,551	9,180	9,180
Nonfarm Residential	41	1,501	638	638
Town	--	--	4	4
Churches)	6	220	143	143
Schools )			69	69
Small Commercial	3	110	550	550
Large Commercial	2	--	2	2
<u>Potential</u>				
Farm )	11	403	1,285 <sup>b/</sup>	900 <sup>b/</sup>
Nonfarm Residential)				
Churches	--	--	33	33
Schools	--	--	10	10
Small Commercial	--	--	85	85
Large Commercial	1	--	1	1
<u>Other</u>				
Idle Services	19	695	(500) <sup>c/</sup>	--
Vacant	17	622 <sup>d/</sup>	--	--
Abandoned	17	622	--	--
House Not Wired	1	37	--	--
Total Units	294	10,761	12,000 <sup>e/</sup>	11,615
Total Estimated Ultimate Consumers of Electricity				11,615

a/ Derived by expanding sample data by reciprocal of the sampling rate.

b/ Includes estimate of 350 idle services to be reconnected.

c/ Estimated by manager in letter to REA dated December 22, 1952.

d/ Cooperative advises these are billed consumers included in served.

e/ Manager's estimate of number expected to be receiving service in 10 years.



NATURE OF PRESENT AND INDICATED FUTURE  
CONSUMPTION OF ELECTRICITY AS REVEALED BY THE SURVEY

A tabulation of the raw data secured from the respondents revealed the monthly consumption figures shown in the following table.

TABLE II  
INDICATED MONTHLY KWH CONSUMPTION<sup>a/</sup>

Consumer Class	Present	Future <sup>b/</sup>	Percent Increase
Farm	179	242	35
Nonfarm Residential	131	157	20
Weighted Average	170	226	33

<sup>a/</sup> Based on indications by respondents in the survey and average energy requirements as determined by REA for the country at large.

<sup>b/</sup> Based on what respondents expect to add in 3 years.

It should be noted that the consumers classified as farm actually averaged 159 kwh per month during 1952; nonfarm consumers averaged 101 kwh per month. All respondents actually averaged 148 kwh for the period. Thus, it appears that farm consumers in this area use only 89 percent of REA average usage; nonfarm, only 77 percent; and combined, the sample consumers used 87 percent of the average usage as determined by REA for the country at large.

1/ (cont'd from page 1) of 125 kwh  $t = \frac{148-125}{13.75} = 1.67$  where tabular  $t_{.05} = 1.973$ .  
A comparison of connections of all consumers with that of respondents is as follows:

<u>Time Connected</u>	<u>All Consumers</u>	<u>Respondents in Sample</u>
Before 1945	19.7%	8.8%
1945-1948	30.5%	28.7%
1949-1953	49.8%	62.5%

Summarizing, it appears that the sample consumers are presently using more electricity than the average for the cooperative as a whole. Also, the sample includes more of the newer and fewer of the older consumers than is true for the entire system. These variations have been taken into consideration in the preparation of this analysis.



Table III presents statistics that relate economic characteristics of the area to indicated present and future kwh usage. In this connection the data have been summarized to show the level of usage as it appears to be correlated with the level of living of respondents in the survey.<sup>2/</sup>

**TABLE III**  
**INDICATED PRESENT AND FUTURE KWH USAGE RELATED**  
**TO LEVEL OF LIVING BY CLASS OF CONSUMER**

Characteristic	Farm				Nonfarm			
	Class I	Class II	Class III	Class IV	Class I	Class II	Class III	Class IV
Number of Schedules	41	41	51	46	8	9	17	7
Indicated present kwh/mo.	264	180	114 <sup>a/</sup>	75	224	131	111	76
Indicated to be added (mo.)	86	70	31 <sup>a/</sup>	19	31	32	30	0
Indicated future kwh/mo.	350	250	145 <sup>a/</sup>	94	255	163	141	76
Percent not planning to add appliances or equipment	24	29	43	57	63	33	53	86
Ave. No. persons in household	4	4	5	6	4	4	4	4
Percent owner-operated <sup>b/</sup>	95	95	84	67	100	100	87	57
Percent white	100	98	78	66	100	89	82	71
Ave. size of farm	131	124	79	64	48	40	36	36
Ave. No. years with electric service	7	5	5	4	7	6	5	7
Percent having off farm income	40	45	24	21	100	78	82	86
Ave. No. days work off farm <sup>c/</sup>	152	164	79	107	353	236	233	203
Percent using butane gas	73	50	31	16	88	78	18	43

<sup>a/</sup> Excludes one farm presently using infrared lamps for brooding 32,000 chicks and one farm planning to use infrared lamps for brooding 10,000 chicks.

<sup>b/</sup> In whole or in part.

<sup>c/</sup> Based on those having off-farm work.

<sup>2/</sup> Levels of living as subjectively determined from the general appearance of the homestead were graded in four classes. Examples of these are shown in Figure 3.



Historical consumption records for farm consumers in the survey indicated a generally rising average consumption. This is revealed in Table IV.

TABLE IV

AVERAGE MONTHLY KWH CONSUMPTION  
OF 196 FARM AND NONFARM CONSUMERS<sup>a/</sup>

<u>Number in Class</u>	<u>Years Service</u>	<u>1945</u>	<u>'46</u>	<u>'47</u>	<u>'48</u>	<u>'49</u>	<u>'50</u>	<u>'51</u>	<u>'52</u>
27	8 or more	78	97	129	140	163	186	205	226
7	7	--	49	71	69	84	118	130	133
8	6	--	--	61	87	128	220	350	349
12	5	--	--	--	78	90	108	150	184
75	4	--	--	--	--	77	96	112	137
36	3	--	--	--	--	--	66	86	116
16	2	--	--	--	--	--	--	81	96
15	1	--	--	--	--	--	--	--	51
Weighted Average		78	87	106	109	100	112	132	147

<sup>a/</sup> Records of consumption not available prior to 1945.

A saturation of electrical appliances and equipment measured in terms of the percent of consumers presently having them and a corresponding percent anticipated in the future was compiled from field schedules. The difference in saturation as revealed by the increase in percentage points was converted to indicated future kwh requirements per 100 consumers for each appliance and piece of equipment. This is shown in Table V.

TABLE V  
PRESENT AND INDICATED SATURATION OF ELECTRICAL  
APPLIANCES AND EQUIPMENT AND CORRESPONDING INDICATED  
INCREASE IN KWH USAGE OF FARM AND NONFARM CONSUMERS

<u>Appliance</u> <u>or</u> <u>Equipment</u>	<u>Percent of Consumers</u>		<u>Increase<sup>a/</sup></u>	
	<u>Presently</u> <u>Using</u>	<u>Indicating</u> <u>Future Use</u>	<u>Percentage</u> <u>Points</u>	<u>KWH Usage (Per</u> <u>100 Consumers)</u>
Animal Clipper	1	1	0	--
Blanket	1	1	0	--
Brooder (Hover)	4	4	0	--
Brooder (Infrared)	3	4	1	11,550
Churn	19	19	0	--
Clock	21	21	0	--
Drill Press	1	1	0	--
Fan (Household)	42	44	2	30



2-Table V - Mississippi 22 Leake - May 29, 1953

Appliance or Equipment	Percent of Consumers		Increase <sup>a/</sup>	
	Presently Using	Indicating Future Use	Percentage Points	KWH Usage (Per 100 Consumers)
Fan (Attic Ventilator)	1	2	1	100
Fan (Window Ventilator)	2	3	1	50
Fence	11	11	0	—
Food Mixer	7	8	1	25
Heating Pad	9	9	0	—
Home Freezer	12	36	24	21,600
Hot Plate	82	82	0	—
Iron	95	95	0	—
Lighting				
Dairy Barn	5	6	1	35
Garage	3	4	1	8
General Barn	20	20	0	—
House Lighting	100	100	0	—
Milk House	1	1	0	—
Other Buildings	8	9	1	12
Poultry Brooder House	7	7	0	—
Poultry Laying House	6	7	1	35
Yard	7	8	1	18
Livestock Watering	2	2	0	—
Milk Cooler	0	2	2	3,936
Milking Machine	1	5	4	1,600
Percolator	4	4	0	—
Power Saw	1	1	0	—
Pressure System (Greater than 22')	36	49	13	3,120
Radio	86	87	1	100
Range	30	37	7	8,400
Refrigerator	89	92	3	720
Soldering Iron	1	1	0	—
Space Heater	3	3	0	—
Sewing Machine	8	8	0	—
Television	1	4	3	1,080
Toaster	1	1	0	—
Tool Grinder	2	2	0	—
Vacuum Cleaner	4	5	1	20
Waffle Iron	2	2	0	—
Washing Machine	58	67	9	315
Water Heater with Bath	7	12	5	15,000
Water Heater without Bath	1	1	0	—

<sup>a/</sup> Based on average energy requirements determined by REA. Data do not reflect instances where more than one of the same appliance exists per consumer. These cases are rare and do not affect the over-all pattern materially.



ECONOMIC CHARACTERISTICS

Although population numbers increased steadily over the period 1920-1940, there was a decline of 19 percent during the decade 1940-1950 (Table VI). The area compared with the State is hardly holding its own in population. The number of farms in this area decreased from 1930-1945. Because of the increase in number of part-time and residential farms, the number of farms increased more than 8 percent during the 5-year period 1945-1950. At the present time, nearly half of all farms in the area are part-time or residential in character.

In the survey, 41 respondents of 220 were classified as "nonfarm." Although they did not appear to meet the 1950 Census definition of a farm, it is believed that many of these 41, as well as some of the farm respondents, might logically be placed in the part-time or residential farm classification. Both observations in the area and census statistics point to substantially increased numbers of part-time and residential farmers and a sizeable amount of the residents' income coming from off-farm sources. Because of this trend, the task of classifying farm separate from nonfarm is difficult.

TABLE VI

ECONOMIC TRENDS RELATED TO THE RATE OF  
INCREASE IN USE OF ELECTRIC POWER

Item and Relationship		Trend				
<u>Population</u>		<u>1920</u>	<u>1930</u>	<u>1940</u>	<u>1950</u>	
Service Area		36,276	48,494	52,452	47,340	
State of Mississippi		1,790,618	2,009,821	2,183,796	2,178,914	
Ratio Area to State		.0203	.0241	.0240	.0217	
<u>Number of Farms</u>		<u>1930</u>	<u>1935</u>	<u>1940</u>	<u>1945</u>	<u>1950</u>
Service Area		8,870	8,592	8,589	7,640	8,285
State of Mississippi		312,663	311,683	291,092	263,528	251,383
Ratio Area to State		.0284	.0276	.0295	.0290	.0330
<u>Average Income From All</u>						
<u>Farm Products Sold</u>		<u>1929</u>		<u>1944</u>		<u>1949</u>
Service Area		873		830		741
State of Mississippi		910		1,080		1,351
Ratio Area to State		.959		.769		.548
<u>Average Value of Land</u>						
<u>and Buildings</u>		<u>1930</u>	<u>1935</u>	<u>1940</u>	<u>1945</u>	<u>1950</u>
Service Area		1,300	958	1,275	1,692	3,535
State of Mississippi		1,818	1,190	1,632	2,457	4,421
Ratio Area to State		.715	.805	.781	.689	.800



2-Table VI - Mississippi 22 Leake - May 29, 1953

Item and Relationship		Trend					
<u>Cost of Purchased Power</u>		<u>1944</u>	<u>1946</u>	<u>1948</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>
Mississippi 22 Leake		.65	.62	.58	.52	.54	.53
All Co-ops in Miss.		.68	.66	.61	.57	.55	.54
<u>Average Monthly Kwh Con-</u>							
<u>sumption Per Farm Consumer</u>				<u>1948</u>	<u>1950</u>		<u>1952</u>
Mississippi 22 Leake				83	96		122
Neighboring Cooperative (also TVA)				84	99		116
Neighboring Cooperative (not TVA)				59	68		78

It is doubtful that farm numbers will increase substantially during the next 10 years. The expansion in numbers due to the increase in the part-time and residential farms appears to have been completed. The industrial activity accounting for this situation though likely to continue shows no signs of future expansion at this time. Diversification is likely to lead to larger farms. This will result in a decline in the number of full-time farms.

Practically all farm operators interviewed in connection with this survey indicated raising some cotton, corn, peanuts, hay and peas. However, field crop farming is becoming less important and diversification, including dairy cattle, beef and poultry, shows signs of soon becoming generally accepted.

Farms in the area averaged 67 acres in 1950. They were valued at \$3,535, or at an average of \$54 per acre. This is an increase of 108 percent over the 1945 value of land and buildings per farm. County agents indicate that little land has changed hands in the area. Average agricultural land was selling at from \$40 to \$50 per acre and that located along highways brought up to \$100 per acre. One banker indicated that land in this area should sell for \$20 to \$30 per acre for cultivation and \$5 to \$10 for timberland, but no land can be purchased in the area his bank serves for less than \$100 per acre.

Compared with other areas over the country, the banks do not appear to have as high a ratio of loans to deposits. In Leake County, the ratio is 1.0 to 4.9, and in Neshoba the apparent ratio is 1.0 to 9.3. It was learned in the area that until 4 years ago bankers would not grant credit except for cotton production. At present this picture has changed some and credit can be obtained for purchasing livestock or other production needs. Feed dealers are to some extent granting credit and providing management, production and marketing assistance to farmers engaged in broiler production.

Banks are actively engaged in discounting notes presented by appliance and equipment dealers. One bank has more than \$100,000 in discounted paper on electrical appliances. According to dealers contacted, about 85 percent of all sales of electrical appliances are made on an installment credit basis.



Mississippi 22 Leake - May 29, 1953

Income to area residents is largely from farm enterprises, but a substantial amount of off-farm income contributes significantly to the consumers' ability to purchase appliances and equipment. Average income from all farm products sold on area farms in 1949 was \$741. This is 11 percent below the 1944 average and only about one-half the 1949 State average. Thus the importance of off-farm work to the general economy of the area takes on unusual significance. As shown in census material and verified in the area, the 1949 season and others since that time were plagued in varying degrees with droughts, and poor crops were harvested. Usually farm products make a greater contribution to the total income than was the case in 1949.

The survey revealed that 31 percent of those respondents classified as farm and 85 percent of those classified as nonfarm worked off the place. Most of those nonfarm respondents who had no work were receiving old age assistance. Off-farm employment consisted of that shown in the following table.

CLASSIFICATION OF OFF-FARM EMPLOYMENT

<u>Type of Work</u>	<u>Class of Consumer</u>	
	<u>Farm</u>	<u>Nonfarm</u>
Skilled Trades	21.7	21.1
Logging and Lumbering	15.0	10.5
Textile Workers	13.3	13.2
Public Works	10.0	5.3
Trucking	8.3	0.0
School Bus Driver	8.3	0.0
Proprietors and Operators	5.0	15.8
Professional	5.0	2.6
Retail Sales	0.0	10.5
Traveling Salesmen	3.3	2.6
Farm Laborers	3.3	10.5
Laborers (outside service area)	3.3	5.3
Service Work	1.7	2.6
Other	1.7	0.0
Total	100.0	100.0

Skilled trades including carpenters, mechanics, painters, welders and factory workers, logging and lumbering, and work in textile manufacturing accounted for the major portion of off-farm employment for both classes of respondents. A larger share of farm respondents were active in public work whereas proprietors and operators of gins, grist mills, gasoline filling stations and stores, retail sales and farm labor were important endeavors of those consumers classified as nonfarm.



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In 1950, 67 percent of the farms in the area were electrified and 8 percent had telephones. Presently, there is some interest in securing additional telephone service. The Southern Bell Telephone Company has extended service to some of this area through joint use agreements. It is understood that because of existing State laws it is not possible to organize cooperative rural telephone systems.

Typical in the past of depicting southern agriculture was to show a tenant operator on a small place tilling the soil with a mule and simple equipment. During the time the appraiser was in the area, cotton and corn were being planted. Although there were still many horse and mule drawn implements in use, there were also a substantial number of farms being worked with tractors and tractor equipment. It was readily apparent that this area is in a transition stage from row crops to diversification with noticeable progress but with much yet to be done before the goals of the advocates of better farm management for the area are fully realized.

A local banker was asked his opinion as to whether class 3 and 4 homes would be capable of affording the major electrical appliances such as ranges and home freezers. It occurred to the appraiser that in some instances the electrical appliances in the homes were of more value than the house itself. This banker replied that many among this class could afford better homes but preferred to live as they always had and that the purchasing of such modern electrical equipment was a primary step in raising their level of living. He emphasized, however, the need for this area to provide incentives to increase the over-all level of living of its households.

It was the universal opinion of community leaders that the biggest area problem was the conversion from row crops to a diversified agriculture. It was indicated that at present milk was being shipped into the area for local consumption. Community leaders on the other hand appeared proud of the progress that has been made with the townspeople on their accepting the fact that they are dependent on agriculture. As a result, their cooperation in behalf of a more stable agriculture has greatly improved. Consolidated schools are given as one reason for this change in attitude.

Limited rail facilities (Canton and Carthage) are available in Carthage and the Gulf, Mobile, and Ohio Railroad serves the town of Philadelphia. Trucks are used primarily for transport in the area, particularly for the pickup of milk. The milk produced in the area is hauled to Philadelphia, where it is transferred to tank trucks that take it to the Pet Milk Condensing Plant in Kosciusko. The major road network in the area is in state of good repair. Some of the roads in remote parts of the area are not passable, particularly during periods of heavy rains.



### PHYSICAL CHARACTERISTICS

This area lies principally in the Red Hills of central Mississippi. It has developed on two geologic formations, Ackerman clay in the east and the Holly Springs sand in the west. Topographically, the area is thoroughly dissected, hilly upland with sandy and sandy clay soils relatively infertile. Elevation of most of the area is somewhat above 500 feet. About the Pearl River and its tributaries that provide drainage for the area, the elevation grades to near sea level. There is some swamp land. According to the Soil Conservation Service, moderate sheet erosion occurs and frequent gullies exist.

The average length of growing season is 229 days, extending from March 21 through November 5. The average January temperature is 47° and the average July temperature is 80°. The minimum on record is 7° below zero; the maximum, 104° above. The average annual precipitation is about 47 inches.

### GROWTH IN USE OF ELECTRICITY

This cooperative has undertaken an extensive power use program. It has employed two men for this purpose. One of these men is responsible for educational programs that occur weekly over three local radio stations. He is also responsible for dealing with consumers on matters pertaining to most phases of usage of electrical equipment. The other man devotes his time to working with appliance dealers in the area and develops promotional campaigns in cooperation with them. An electric range campaign held during the last three months of 1952 increased the saturation of electric ranges on the cooperative's system by 327. The home freezer campaign now under way to extend until June 30 has a goal of about 400. At the time of the appraisal, 40 had been connected.

During the appraisal, respondents indicated reasons for not using more electricity as follows:

<u>Reason for Not Using More Electricity</u>	<u>Class of Consumer</u>	
	<u>Farm</u>	<u>Nonfarm</u>
Cannot afford to use more	45.2%	53.8%
Using all we need	28.6%	30.8%
Takes time to add appliances	26.2%	15.4%
	<u>100.0%</u>	<u>100.0%</u>

The following table reveals consumers' indications of future intentions to purchase appliances and equipment and may be used to appraise the advisability of continuing the power use program and to develop a plan if it is decided that it be continued.



PERCENT OF CONSUMERS INDICATING INTENTIONS  
TO PURCHASE ELECTRICAL APPLIANCES AND EQUIPMENT  
BY CLASS OF CONSUMER AND APPARENT LEVEL OF LIVING

Appliance to be Added	Farm Consumers				Nonfarm Consumers			
	Level of Living				Class			
	I	II	III	IV	I	II	III	IV
Any Appliance	76	71	57	43	37	67	47	14
Home Freezer	49	34	14	9	37	22	19	0
Water Heater	12	10	6	0	0	0	0	0
Range	5	5	12	7	0	11	18	0
Pressure System	10	22	14	7	0	11	6	0
Television	7	2	0	0	0	0	0	0
Brooder (Infrared)	2	0	0	0	0	0	0	0
Milk Cooler	0	2	0	0	0	0	0	0
Milking Machine	2	5	4	2	0	0	0	0

ANALYSIS OF FUTURE KWH CONSUMPTION

Since this cooperative was energized in 1938, average monthly farm and nonfarm residential consumption rose to 127 kwh for the 12 months ended March 1953. Over the entire period, this is an average increase of about 9 kwh per month per year. Since 1949, the increase has been from 90 to 124 kwh in 1952. This is an average of about 11 kwh per month per year.

To achieve the average of 169 kwh per month ( $127 \times 1.33$ ) indicated by respondents, the specific kwh resulting from indicated future saturation of appliances as shown in Column 2 of Table VII must be achieved.

Experience has proved that even though consumers indicate their intentions to add on the basis of "within the next 3 years" that generally it requires longer to achieve the indicated consumption. For this general area, the length of time required to reach the indicated, based on experience, has been 5 years.

More than two-thirds of the indicated increased use is indicated to be attained through the addition of home freezers, water heaters and electric ranges. Also, an increase is expected to occur through the addition of infrared brooding in production of broilers.

There are other factors that must be considered in arriving at future estimates of electric consumption. Among these are (1) the extent to which power use promotion accelerates the purchases of electrical appliances and equipment, (2) the effect of the relatively low cost of power available, (3) the extent of butane gas usage likely to continue in the area, and (4) the extent to which related economic trends are likely to have their impact upon the indicated future consumption.



TABLE VII

INDICATED AND ESTIMATED KWH USAGE, FARM AND NONFARM  
CONSUMERS BY CHARACTER OF LOAD PER 100 CONSUMERS, 1956<sup>a/</sup>

Use (1)	: Indicated : : Future : : Saturation :	: Indicated : : Increase : : (3) :	: Percent of : : Indicated : : Increase : : (4) :	: : : Estimated : : Increase : : (5) :	: : : Present : : Use : : (6) :	: Estimated : : Future : : Total : : (7) :
<u>Major Household Uses</u>						
Home Freezer	36	18,792	31.84	15,034	8,573	23,607
Water Heater	12	13,050	22.11	10,440	18,574	29,014
Range	37	7,308	12.38	5,846	28,574	34,420
Pressure System	49	2,714	4.60	2,171	6,858	9,029
Television	4	940	1.59	752	286	1,038
<u>Major Productive Uses</u>						
Brooder, Infrared	4	10,049	17.02	8,039	17,411	25,450
Milk Cooler	2	3,424	5.80	2,739	--	2,739
Milking Machine	5	1,392	2.36	1,114	317	1,431
<u>Miscellaneous</u>	--	1,355	2.30	1,084	69,351	70,435
Total		59,024	100.00			
<u>Estimated increase in annual average per 100 consumers</u>						
(total) - 1956				47,219		197,163
<u>Estimated increase in annual average per consumer</u>						
(total) - 1956				472		1,972
<u>Estimated increase in monthly average (total) - 1956</u>						
				39		164

<sup>a/</sup> Adjusted to take into account that appliance usage and amount of electricity required is only 87 percent of average for United States as determined by REA, and average consumption of respondents was 18 percent greater than for all consumers.

The power use activity has already been discussed. It was apparent that appliances were being added at a greater rate than had there been no such program.



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The regular TVA retail rate schedule is in effect in this area. It is as follows:

#### RESIDENTIAL RATE SCHEDULE

First 50 kwh (min. bill).....	\$2.00
Next 50 kwh.....	\$1.50
100 kwh.....	\$3.50

Next 100 kwh @ 2¢ per kwh
Next 200 kwh @ 1¢ per kwh
Next 1000 kwh @ .4¢ per kwh
Over 1400 kwh @ .75¢ per kwh

#### COMMERCIAL RATE SCHEDULE

First 150 kwh @ 3¢ per kwh
Next 350 kwh @ 2¢ per kwh
Next 1500 kwh @ 1¢ per kwh
Excess of 2000 kwh @ .8¢ per kwh
Plus 10% on net amount of bill
Plus 1¢ per kwh on first 100 kwh

There has been some concern on the part of the cooperative that the 4 mill bracket for usage of 400 to 1000 kwh per month may have serious effects on the future revenue potential, especially as many consumers' loads grow into that bracket of usage.

For the purpose of future study of rates, a table giving a frequency distribution of future indicated consumption is presented as follows:

TABLE VIII

#### FREQUENCY DISTRIBUTION OF INDICATED FUTURE MONTHLY FARM AND NONFARM KWH CONSUMPTION

Average Monthly Consumption	Percent of Respondents
Under 50	5.0
50 - 99	32.0
100 - 199	37.0
200 - 299	10.0
Over 300	16.0
	100.0



Table IX indicates that 42 percent of the respondents are using butane gas for one or more purposes. Most of the present gas usage resulted from electricity not being available in the area at the time the utility was desired by the respondent. Area residents who plan to add gas in the future are practically all those who plan to heat their homes. It is quite likely that if low power costs and good service continue, many of those using gas for cooking and water heating will use electricity for these purposes when their present appliances need to be replaced. However, because of the competition present, the cooperative will need to insure efficient and low cost service to retain the market.

TABLE IX

STATUS OF BUTANE GAS USE 213 RESPONDENTS  
REPORTING IN RANDOM SAMPLE SURVEY<sup>a</sup>

Consumers' Position With Respect to Use of Gas	Number in Survey	Percent of Total
Not Using and Not Planning to Use	113	53.0
Not Using but Planning to Use	11	5.0
Presently Using	89	42.0
		<u>100.0</u>
Cooking	74	
Water Heating	22	
House Heating	62	
Refrigeration	3	
Chick Brooder	1	

<sup>a</sup>/ All served consumers indicating status with respect to butane gas usage.

As previously shown in Table VI, population numbers have dropped off, but farm numbers have increased even though the number of the farms in the State have decreased. This is largely due to the substantial increase in the number of residential and part-time farms in this area. In connection with this trend, the average value of products produced per farm in the area is becoming less favorable. The trend in average value of land and buildings per farm is favorable to the area, but the absolute values are below the State level. Trends in cost of power and resulting retail rates have favorably affected the level of kwh usage.

Considering the several factors believed to affect future consumption of electricity in this area, it is estimated that within 3 years 80 percent of the indicated increase will be achieved. Estimated kwh increases and total usage by type of appliance or equipment to be achieved in 3 years are shown in Columns 5 to 7 in Table VII.



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### COMMERCIAL CONSUMPTION

Commercial consumption constitutes a small part of the over-all load on this system. This is primarily due to the fact that commercial utilities either serve or have the right to serve most of this type of consumer. Illustrations of the commercial consumers on this system are shown in Figure 7.

In view of the data available and the foregoing analysis, the following estimates might reasonably be expected to be attained by the years specified:<sup>3/</sup>

<u>Class of Consumer</u>	<u>Calendar</u> <u>1952</u>	<u>1955</u>	<u>1958</u>	<u>1963</u>
Farm	122	155	185	240
Nonfarm and Town Residential	172	190	210	240
Small Commercial	301	340	385	450
Public Buildings	94	120	135	155
Street Lights (annual)		4,400	4,700	5,000
Large Commercial (annual)				
A. Deweese Lumber Company				
(200 kw - 2 meters combined)		485,000	485,000	485,000
Lee Bros. Feed Company (25 kw)		10,000	10,000	10,000

- 3/ The estimates established as a result of this analysis are generally consistent with an independent study published for this area. See "Outlook for Future Use," p. 34, Electricity on Farms in the Clay Hills Area of Mississippi, Bulletin 493, dated August 1952, Mississippi State College Agricultural Experiment Station, State College, Mississippi.